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AMENDMENT TO THE CLAIMS

1. (currently amended) A data management apparatus for managing data used when executing an application program stored on a computer readable recording medium, said data management apparatus included in a switching system for providing services related to communication, comprising:

a data field storing the data, wherein the data filed is composed of a plurality of data setting areas, data is stored in a single or plural data setting areas according to a size of the data;

an address acquirer acquiring an address in said data field of the data for which an access is requested by the application program when receiving a pointer lending request from the application program;

a lending pointer table storing at least one of pointer records, each of which has the acquired address and a pointer corresponding to the acquired address, the pointer indicating an address of the pointer record; and

a lender reading out the pointer from said lending pointer table informing the application program of the pointer corresponding to the acquired address when the acquired address is registered in the lending pointer to lend the read pointer to the application program;

an allocation controller determining, when the application program requests to add data to the data field, if the data field has a first empty area that exists between the dat setting areas each having a state of in-use and is composed of a single or plural continuous data setting areas, each of which has a state of unused, having a size equal to or larger than a size of the data to be added, to store the data to be added in the first empty area;

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an adder storing the data to be added in the data field according to a determining

result of the allocation controller; and

a data setting area management table to register use-condition of each of the data

setting areas, an address of the first empty area and an address of the second empty area,

the data setting area management table being referred to the allocation controller to

determine a storing position for the data to be added.

2. (currently amended) A data management apparatus according to Claim 1, further

comprising:

a reader reading out, when receiving the lent pointer from the application program,

reading out the address corresponding to the lent pointer from the lending pointer table,

reading out the data stored in said data field according to the read address , and giving the

read data to the application program, wherein the address stored in the pointer record is

changed into an address of a relocation destination in the data field in response to

relocation of the data stored in the data field.

3. (currently amended) A data management apparatus according to Claim 2, further

comprising:

a deleter deleting the data to be deleted from stored in said data fieldaccordng to a

deleting request from the application program; and

a record deleter deleting the pointer record having the address in said data field of

the data which is deleted by said deleter, from said lending pointer table.

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4. (Previously Presented) A data management apparatus according to Claim 3, further comprising:

an invalidity informer informing the application program of invalidation of the lent pointer when the record deleter deletes the pointer record having the lent pointer.

5. (currently amended) A data management apparatus according to Claim 2, further comprising:

a relocater relocating the data stored in said data field when receiving a relocation request; and

an address updater detecting the pointer record having the address in said data field of the data that is relocated by the relocater, from the lending pointer table, and updating the address in said data field stored in the detected pointer record according to a result of relocation of the relocater.

6. (Previously Presented) A data management apparatus according to Claim 5, wherein said address updater, when said reader is reading out the data from said data field on the basis of the address of said data field stored in the pointer record, waits the updating process of the address in the pointer record until said reader finishes the reading process.

7. (Previously Presented) A data management apparatus according to Claim 1, further comprising:

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a record deleter, when receiving a notification indicating that the application program does not use the lent pointer from the application program, deleting the pointer record having the lent pointer from said lending pointer table.

8-10. (Canceled)

11. (currently amended) A data management apparatus according to ~~Claim 8~~claim 1, wherein:

said address acquirer, when acquiring the address, refers to said data setting area management table, and detects the use-condition of the data setting area corresponding to the acquired address from said data setting area management table; and   said lender, when the detected use-condition is under the condition of deletion of data, informs the application program that there is no data for which an access is requested by the application program.

12. (currently amended) A data management apparatus according to ~~Claim 8~~claim 1, wherein when data is stored in a plurality of data setting areas in the data filed by the adder, ~~said data setting area management table holds~~ link information related to at least one of the links~~a link~~ between the plurality of data setting areas ~~about a data held by the plurality of data setting areas~~is stored in the data setting area management table, wherein the link information indicates a connection relationship of the plurality of data setting areas.

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PAGE 8/22 * RCVD AT 1/8/2007 2:50:29 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/1 * DNIS:2738300 * CSID:2129408986 * DURATION (mm-ss):07-46

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13. (currently amended) A data management apparatus according to ~~Claim 8~~claim 1, wherein said data setting area management table, when a data stored in a data setting area is relocated to ~~other~~another data setting area by the relocater, ~~holds~~the relocater stores, in the data setting area management table, relocation condition information including information indicating the data setting area ~~corresponding to~~being a relocation destination of the data that is relocated.

14. (currently amended) A data management apparatus according to ~~Claim 8~~claim 1, wherein a single or plural data setting areas compose a data storage area for storing data;

a size of the data storage area is defined depending on the number of data setting areas for composing the data storage area;

said data setting area management table holds a frequency data summing up ~~the~~a number of times of allocation of data into the data setting area generated by addition of data and a~~the~~ number of times of release of data setting area generated by deletion of data, according to the size of the data storage area; and

said allocation controller, when said data field has at least one of continuous empty areas and there is no continuous empty area which meets a size of data requested to be added, determines at least one of data setting areas for storing the data requested to be added on the basis of the frequency data, wherein said allocation controller determines the at least one of data setting areas so that a continuous empty area with the size that the sum of allocation/release times indicated by the frequency data is a maximum is generated through the data allocation.

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15. (canceled)

16. (currently amended) A method for managing data used when executing an application program included in a switching system for providing services related to communication , comprising steps of:

storing the data in a data field, wherein the data filed is composed of a plurality of data setting areas, data is stored in a single or plural data setting areas according to a size of the data;

acquiring an address in the data field of the data for which an access is requested by the application program when receiving a pointer lending request from the application program;

storing at least one of pointer records, each of which has the acquired address and a pointer corresponding to the acquired address, in a lending pointer table, the pointer indicating an address of the pointer record; and

informing the application program of the pointer corresponding to the acquired address when the acquired address is registered in the lending pointer table reading out the pointer from said lending pointer table to lend the read pointer to the application program;

determining, when the application program requests to add data to the data field, if the data field has a first empty area that exists between the data setting areas each having a state of in-use and is composed of a single or plural continuous data setting areas, each of which has a state of unused, having a size equal to or larger than a size of the data to be added, to store the data to be added in the first empty area;

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storing the data to be added in the data field according to a determining result of the allocation controller; and

registering use-condition of each of the data setting areas, an address of the first empty area and an address of the second empty area, the data setting area management table being referred to the allocation controller to determine a storing position for the data to be added.

17. (Previously Presented) A method according to Claim 16, further comprising steps of:

receiving the lent pointer from the application program;

reading out the address corresponding to the lent pointer from the lending pointer table;

reading out the data stored in the data field according to the read address; and

giving the read data to the application program, wherein the address stored in the pointer record is changed into an address of a relocation destination in the data field in response to relocation of the data stored in the data field.

18-19. (canceled)

20. (currently amended) A computer readable medium stores a program for managing data used when executing an application program included in a switching system for providing services related to communication, the program comprising instructions that when executed on a computer perform the steps of:

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storing data in a data field, wherein the data filed is composed of a plurality of data setting areas, data is stored in a single or plural data setting areas according to a size of the data;

acquiring an address in the data field of the data in which an access is requested by the application program when receiving a pointer lending request from the application program;

storing at least one of pointer records, each of which has the acquired address and a pointer corresponding to the acquired address in a lending pointer table, the pointer indicating an address of the pointer record; and

reading out the pointer from said lending pointer table informing the application program of the pointer corresponding to the acquired address when the acquired address is registered in the lending pointer table to lend the read pointer to the application program;

determining, when the application program requests to add data to the data field, if the data field has a first empty area that exists between the data setting areas each having a state of in-use and is composed of a single or plural continuous data setting areas, each of which has a state of unused, having a size equal to or larger than a size of the data to be added, to store the data to be added in the first empty area;

storing the data to be added in the data field according to a determining result of the allocation controller; and

registering use-condition of each of the data setting areas, an address of the first empty area and an address of the second empty area, the data setting area management table being referred to the allocation controller to determine a storing position for the data to be added.

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21. (currently amended) A computer readable medium according to Claim 20, wherein the program further comprising instructions that when executed on a computer perform the steps of:

receiving the lent pointer from the application program;

reading out the address corresponding to the lent pointer from the lending pointer table;

reading out the data stored in said data field according to the read address; and

giving the read data to the application program, wherein the address stored in the pointer record is changed into an address of a relocation destination in the data field in response to relocation of the data stored in the data field.

22. (canceled)

23. (canceled)

24. (Withdrawn) A data management apparatus managing data used when executing an application program included in a switching system for providing services related to communications, the data management apparatus comprising:

a data field to store data, wherein the data field is composed of data setting areas, each of which is allocated address value and has a fixed size, and the data is stored in one or more of the data setting areas corresponding to a size of the data;

a storage unit to store information related to use-conditions of the data setting areas, the information related to use-conditions of the data setting areas including:

(i) a data setting area starting address value, wherein storing the data to the data field is started from a data storing starting point defined to the data field, and a next address value of the address value of one of the data setting areas that has been storing the data and has the furthest distance from the data storing starting point becomes the data setting area starting address value; and

(ii) the first empty continuous area address value, wherein an empty continuous area consists of one or more data setting areas having an empty state and existing between the data setting areas where the data have been storing, the empty continuous area is generated by deleting the data stored in the data field, the empty continuous area has a size corresponding to the number of the data setting areas included in the empty continuous area, the address value of the data setting area included in the empty continuous area having the nearest distance from the data storing starting point becomes the first empty continuous area address value, and the first empty continuous area address value is stored in response to the size of the empty continuous area existing in the data field,

an adding unit adding the data to the data field in response to a request from the application program;

a delete unit deleting the data from the data field; and

a management unit managing the information stored in the storage unit, wherein when the adding unit adds the data to the data field, the management unit determines at least one data setting area allocated the data to be added based on the data setting area starting address value and/or the first empty continuous area address value stored in the storage unit, and updates the

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data setting area starting address value and/or the first empty continuous area address value stored in the storage unit according to a result of determination, the adding unit adding the data to be added to the determined at least one data setting area.

25. (Withdrawn) The data management apparatus according to claim 24, wherein the management unit retrieves the first empty continuous area address value corresponding to a size of the data to be added from the storage unit when the adding unit adds the data to be added to the data field, if the empty continuous area address value corresponding to the size of the data to be added is retrieved, the management unit determines that the data to be added is allocated to the empty continuous area with the retrieved first empty continuous area address value to post the retrieved first empty continuous area address value to the adding unit, when the adding unit stores the data to be added in the data field according to the posted first empty continuous area address value, the management unit updates the first empty continuous area address value in the storage unit corresponding to the size of the empty continuous area that the data to be added is stored.

26. (Withdrawn) The data management apparatus according to claim 24, wherein the management unit retrieves the first empty continuous area address value corresponding to a size of the data to be added from the storage unit when the adding unit adds the data to be added to the data field, if the size of the data to be added is larger than a size of the largest empty continuous area on the data field, the management unit determines that the data setting area starting address value stored in the storage unit is made a starting point and the data to be added is allocated to the data field to post the data setting area starting address value to the adding unit,

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and when the adding unit stores the data to be added in the data field according to the posted data

setting area starting address value, the management unit updates the data setting area starting

address value stored in the storage unit.

27. (Withdrawn) The data management apparatus according to claim 24, wherein in case

the empty continuous area corresponding to the size of the data to be added does not exist on the

data field and the empty continuous area that is larger than the size of the data to be added exists

on the data field, the management unit determines the latter as the empty continuous area used to

allocate the data to be added, read the first empty continuous area address value stored in the

storage unit corresponding to the latter to post to the adding unit, when the adding unit stores the

data to be added in the data field according to the posted first empty continuous area address

value, the management unit updates the first empty continuous area address value corresponding

to the latter in the storage unit.

28. (Withdrawn) The data management apparatus according to claim 27, wherein the

information related to use-conditions of the data setting areas further includes information

indicating a data allocating/releasing frequency corresponding to the size of each of the empty

continuous areas generated on the data field, and wherein

the management unit refers the data allocating/releasing frequency information in case

the empty continuous area corresponding to the size of the data to be added does not exist on the

data field and the empty continuous areas that are larger than the size of the data to be added

exist, and determines one of the empty continuous areas as an empty continuous area used to

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allocate the data to be added so that the empty continuous area having a high data

allocating/releasing frequency is generated through allocating the data to be added.

29. (Withdrawn) The data management apparatus according to claim 24, wherein

(A) in case a deletion of the data stored in the data field with the deleting unit causes an

incidence of a new empty continuous area on the data field and a change of the first empty

continuous area address value corresponding to the size of the deleted data, the management unit

updates the corresponding first empty continuous area address value stored in the storage unit

according to a result of the deletion, and wherein

(B) in case the deleting unit deletes the data stored in the data setting area adjoining the

data setting area having the data setting area starting address value stored in the storage unit, the

management unit updates the data setting area starting address value stored in the storage unit

according to the result of the deletion.

30. (Withdrawn) The data management apparatus according to claim 24, wherein the

information related to use-conditions of the data setting areas further includes in-use/not-in-use

information indicating an in-use state or not-in-use state of each of the data setting areas and link

information indicating a link between the data setting areas that have been holding the data with

the size that is larger than the size of one data setting area, and wherein

when receiving a relocation request of the data stored in the data field, the management

unit

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(1) determines, as a relocation target, the data stored in at least one data setting area including the data setting area adjoining the data setting area having the data setting area starting address value stored in the storage unit,

(2) determines the empty continuous area becoming a relocation destination of the relocation target data based on the first empty continuous area address value stored in the storage unit,

(3) when the relocation target data is relocated to the empty continuous area corresponding to the relocation destination, updates the in-use/not-in-use information stored in the storage unit related to the data setting areas corresponding to a relocation source and the relocation destination of the relocation target data,

(4) when the relocation of the relocation target data cause a change of a link between the data setting areas, updates the link information stored in the storage unit,

(5) when the relocation of the relocation target data cause a change of the first empty continuous area address value, updates the first empty continuous area address value stored in the storage unit,

(6) when the relocation of the relocation target data cause that the data setting area adjoining the data setting area with the data setting area starting address value becomes the not-in-use state, updates the data setting area starting address value stored in the storage unit.

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